shown in the quinquennium 1941-5. Conditions like obesity, alcoholism, high blood pressure had had less chance to operate.

Even when the full rigours of reduction of supplies came into force in 1948 the consumption level of 2,700 calories would still be sufficient to cover the population. That figure was made up as to 72% of calories distributed as rations, the remainder was derived from the diverse avenues of distribution he had already named. The average for each school meal was 849 calories.

General Discussion

The PRESIDENT, in throwing open the meeting to discussion, said that it was not merely a question of the value of the diet, but of obtaining it. Many of the calories in the ration must be spent in queueing to get it. Dr. NEVIL LAYTON said that people were apt to compare European countries with Britain, to the latter's advantage, but actually, although the ration in Norway, Holland, and Czechoslovakia might not be generous, the fats were approximately double the amount obtainable in Great Britain. He had come across cases of nutritional oedema in this country. Dr. G. E. BREEN asked for the basis of the assertion that, before the war, one-third of the population was underfed. Assuming that the unemployed were underfed, they and their dependants would not have amounted to more than four-and-a-half millions, or 10% of the population. Surely the lowered rates of mortality or morbidity could justly be ascribed to the sulphonamides and penicillin, to diphtheria immunization, and to other advances which had made their appearance during the last ten years—one of the most revolutionary periods in the history of medicine. He complained of a certain presumption and arrogance on the part of professional nutritionists. He wondered how their bold statements would look in thirty years' time.

Mr. DICKSON WRIGHT came down heavily against the proposition that the present diet was undermining health. In the present company he could detect no signs of malnutrition; they gave the appearance of a very well fed assembly. Some of the arguments used in support of the proposition had been trivial. The occurrence of diseases like impetigo had been cited as evidence of malnutrition. Yet it was only a short time ago that a gentleman from the United States, that land of plenty, arrived at London Airport and was found to be suffering from impetigo, and was not allowed to remain but was sent back by the next aeroplane to his own country. If we were faced with real food deficiency, what about the millions we spent on alcoholic liquor and on tobacco? What food those millions would purchase! It had even been suggested by the principal speaker in favour of the proposition that our present diet was the cause of the decline in morals. It made him imagine a co-respondent in the divorce court begging the judge not to be too hard upon him because he had been underfed!

The openers made brief replies. Dr. BICKNELL begged for a serious decision on the part of the meeting—a decision, he said, the effect of which would go beyond that assembly. Sir JACK DRUMMOND claimed that no concrete facts had been brought forward to support the view that there had been deterioration of health as a result of diet. All the objective evidence went to show that the health of the nation was not undermined. Indefinite statements about skin conditions, gastro-enteritis, chronic rheumatism, and the like, being attributable to diet should not be taken too seriously. He recalled that in 1940 the Parliamentary Secretary to the Ministry of Food announced that on the suggestion of the medical advisers to the Ministry it had been determined to add a proportion of calcium to flour. Within a week the Ministry received protests, which continued for months afterwards, declaring that the calcium in the loaf was responsible for all manner of ills. Medical men claimed that their patients were suffering as a result. Some of these medical men bore well-known names. Yet in actual fact, owing to a hold-up of supply, no calcium was added to flour for eighteen months after the announcement, and after it was added there were no complaints.

The question "That our present diet is undermining the health of the nation" was put to a show of hands, and the vote of the meeting was in the affirmative by about three to one.

Mr. MORTIMER WOLF, in proposing a vote of thanks, said that after this array of statistics and arguments he still thought the best dietetic advice was given from the music-hall stage, "A little of what you fancy does you good."

Correspondence

Penicillin Blood Levels

SIR,—We have just finished investigations concerning the excretion and the role of penicillin in the organism, and we present here a preliminary report. Our first results, which will be published in detail elsewhere (*Acta Medica Hungarica*, Budapest) can be summed up as follows.

The investigations were carried out in order to raise the serum-penicillin level and to diminish its excretion. We found that the hippuric-acid content of the blood and the urine can be easily and continuously increased by means of vegetable protein meals, especially by oatmeal. The troublesome para-aminohippuric-acid drop infusion, suggested by Beyer and his collaborators, can be avoided thus. The serum-penicillin level can be considerably raised by an oatmeal diet, and its excretion can be reduced to such a degree that, six hours after a single injection of 60,000 units, a powerful bacteriostatic effect is still demonstrable in the serum. The quantity of the penicillin and the number of the injections can be reduced thus. A similar effect could be demonstrated by the administration of a single dose of amidopyrine, 0.3 g. per os. If this dose was repeated two-hourly, the bacteriostatic power of the serum could be maintained as long as six hours (20,000 i.u. of penicillin being administered before).

Clinical symptoms led us to assume deficiencies in some vitamins during prolonged penicillin treatment. This is particularly striking in the case of vitamin C. Considering the well-known role of vitamin C in infections, this relation can be of importance in future penicillin treatment and in the explanation of the bacteriostatic effect of the penicillin.

In connexion with sensitization phenomena as the result of penicillin treatment, it was possible to produce with the serum of one of our patients a positive Prausnitz-Küstner reaction (passive transfer of antibodies) after the administration of 21,000,000 units of penicillin. It was also possible to demonstrate changes in the appearance of different cutaneous tests—e.g., von Pirquet—during the penicillin treatment—i.e., the positive von Pirquet test became weaker after a few weeks' treatment or changed into a negative one.

Bacteriological studies revealed that in contrast to data already published in the *Journal* (Ellinger and Shattock, 1946), the bacterial flora of the alimentary tract remains substantially unchanged during the penicillin treatment. Haemolytic streptococci disappear from the flora of the mouth and throat, but other streptococci and staphylococci, as well as penicillin-insensitive bacilli, continue to be present in unaltered quantities. The intestinal flora remains likewise unchanged.

In view of the fact that great quantities of penicillin—a weak acid—are excreted in the saliva and in the bile, the eventual changes of the pH of the saliva and the digestive potency of the intestinal enzymes were investigated after penicillin treatment. The pH of the saliva diminished in every case during the treatment. The diastase values (Wohlgemuth) of the faeces have decreased similarly. These contributions may be of importance in the nutrition of patients during penicillin treatment.

Investigations into the diffusion properties of penicillin reveal the fact that 0.5 i.u. of penicillin does not pierce a layer of fibrin 3 mm. in depth prepared from pure thrombin solution and crystallized fibrinogen solution *in vitro*, but it will be adsorbed by it, since 0.5 ml. of precipitated fibrinogen adsorbs less than 1 but more than 0.5 i.u. of penicillin. This adsorption can be inhibited and adsorbed penicillin can be eluted again by adding a solution of sodium dehydrocholicum.

Difficulties encountered in treating the heart-failure symptoms of penicillin-treated cases of endocarditis led us to investigate the possible interference of penicillin and digitalis. Electrocardiographic changes in penicillin-treated pigeons and their altered response to pure digitoxin show that prolonged penicillin treatment has an influence perhaps directly on the sinus node. There is no real interference between the two drugs, but subclinical sensitization with penicillin and lessening of the B₁-vitamin content of the organism may cause an increase of lipoids, especially of cholesterol. The latter is apt to absorb one part of the digitalis glycoside.

The reduced glutathione level in the blood rises after a single injection of 20,000 i.u. of penicillin and becomes constantly higher during prolonged treatment. This fact may be of importance to the mode of action of penicillin, glutathione being composed of glutamic acid, cysteine, and glycocoll (glycine). It is possible, therefore, that this increased amount of glutathione has a similar effect upon the glutamic acid of bacteria, as sulphonomides have against para-aminobenzoic acid.

Detailed communications in connexion with this work appeared or will be published in the *Orvosok Lapja* and *Magyar Belorvosi Archivum*, both in Budapest, *Acta Medica Scandinavica*, Stockholm, and *Schweizerische Medizinische Wochenschrift*, Basle.—We are, etc.,

L. MOSONYI.

R. HELD.

E. OBLATT.

G. SZÉCSEY.

G. DUCKS.

C. KOCSÁN.

M. SURJÁN.

A. SZENDEI.

Budapest.

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Penicillin for Infected Hands

SIR.—In his letter on the use of penicillin in the treatment of infected fingers (Nov. 1, p. 707) Dr. E. Jaffe suggests that prophylactic penicillin may be used with some success in very early cases to abort the condition. I wonder if this is not rather a precarious statement to make in view of the possible severe consequences. I have recently seen two cases of palmar-space infection which appear to illustrate the risks which may be involved by conservative treatment. It is because of the extreme difficulty of diagnosing the presence or otherwise of pus in these cases that I wondered if Dr. Jaffe or anyone else had experienced any similar recurrences in very early cases of pulp infection.

The first, a young man, reported sick with a diffuse swelling of the palm of his left hand of twelve hours' duration. The swelling was compatible with an early inflammation of the middle palmar space, but was only tender to moderate pressure. He had slept well during the night and had experienced no pain. He had no fever, lymphangitis, or lymphadenitis. He was sent to hospital immediately, where he received a course of 750,000 units of penicillin given in equal three-hourly doses over a period of ninety hours. There was no surgical interference. He was discharged two days later symptom-free and with full function of the hand.

After seventeen days he had six carious teeth extracted. Twenty-four hours later he presented with a similar swelling on his hand, which was throbbing and acutely painful. He was running a slight temperature. He was returned to hospital, where a good result was obtained with surgical drainage of the palmar space followed by a further course of penicillin.

The second case, also a young man, presented with a painless swelling of the palm of his right hand of approximately sixteen hours' duration. The swelling suggested an inflammation of the middle palmar space, but it was tender on deep palpation only. There was no constitutional disturbance. He was sent to hospital, where he received exactly the same conservative treatment as the previous case. On discharge he was symptom-free and had full function of the hand. Fourteen days later he caught his hand in a trapdoor, resulting in mild bruising. The skin was not broken, but the same evening his hand became intensely painful and swollen on the palmar side. When I saw him at midnight (fourteen hours after injury) he presented the clinical picture of very acute middle palmar-space infection. He was returned to hospital, where the condition was successfully treated with surgical drainage followed by a prolonged course of penicillin. The final result was excellent. (There had been no bony injury.)

It would appear probable that despite the short duration of the original symptoms a small pocket of pus had formed in both cases, that the first course of penicillin had been sufficient to sterilize this pus and render it quiescent for a relatively long period, and that reinfection of the focus was brought about in the first case by a transient bacteraemia and in the second by moderate trauma. These cases demonstrate the results which may follow neglect of the simple rule that chemotherapy should never be used in cases of suppuration in the absence of adequate surgical drainage. But, with this in mind, they further show the extreme difficulty of diagnosing the presence or absence of pus in very early cases. The severity of the second infection and the increased loss of man-hours involved, despite clinically adequate treatment with penicillin, demonstrate the dire results which may follow misjudgment in the case of palmar-space

infections. I wondered at the time whether more intensive penicillin therapy in the first instance, despite the clinical cure, would have prevented the recrudescences of infection.

It would be interesting to know if others have had similar experience with fascial-space infections, and whether the earlier appearance of pain in pulp infections does in fact increase the chances of successfully instituting penicillin therapy before the actual formation of pus.—I am, etc.,

Leamington Spa.

A. GORDON DINGLEY.

British Food Resources and Requirements

SIR.—According to the report of the conference arranged by the Nutrition Society (Nov. 15, p. 786) I said that the agreement of estimates of food supplied and consumed "was as good as could be expected in view of the low degree of accuracy of dietary surveys." What I actually said was that the agreement was better than could be expected in view of the inaccuracy of estimates of the amount of food imported and produced in the country. The point is important, for if we were getting an average 2,800 calories per head, as reckoned from estimates of imports and production, there would be no need to worry about calories.—I am, etc.,

London, E.1.

J. R. MARRACK.

Food Cuts and Vitamins

SIR.—Your interesting and valuable leading article entitled "Food Cuts and Vitamins" (Nov. 1, p. 696) calls for comment on three separate matters.

First, I conceive it a pity to refer to "the new standards of the National Research Council of the U.S.A." That body, in both editions of its reports and through the mouths of several of its members on a number of occasions, has consistently asserted that it was not laying down dietary standards. It has called its estimates, and given convincing reasons for so doing, "Recommended Dietary Allowances." These allowances, unlike any estimates of requirements, are intended to allow for at least part of the losses that occur during processing, transport, storage, and cooking, and are also meant to "take up the slack" for those individuals at one end of the scale of requirements for any given nutrient. Nothing is more striking in such recent publications as the invaluable monograph of Widdowson on school-children's diets than the extraordinarily wide range of intakes, and these strongly suggest a correspondingly wide range of requirements. The American recommendations are intended to take care of the higher of these requirements and so would obviously supply more than is necessary to those with lower requirements. They cannot, therefore, be themselves regarded as figures for requirements, and are, as their promulgators make clear, simply recommended allowances.

Secondly, I am a little surprised that your comments on riboflavin intake ignore one of the most striking and in some ways entertaining facts revealed by wartime studies of diet. In this country, at any rate, beer and tea can provide an appreciable part of the daily intake of riboflavin and also of nicotinic acid; for the more intemperate they may even provide major contributions.

Finally, there seems to me a serious error in your parenthetical observation that "as is now the accepted practice in this country, the vitamin-A value of β -carotene is taken as 1 i.u. per 0.6 μ g." Dr. Leslie Harris's article (p. 681), to which you make specific reference in your leader, says quite clearly "carotene is only about one-half or one-third as well utilized by the animal body compared with an equal amount of vitamin A." Without going into elaborate arithmetical details it must suffice here to say that although 0.6 μ g. of pure β -carotene has, by definition, the activity of 1 i.u. of vitamin A, this refers to comparative tests under carefully standardized conditions of vitamin-A-depleted albino or piebald rats. It is universally accepted that the efficiency of converting carotene to vitamin A is much less for man and other domestic animals receiving mixed diets and not obviously short of vitamin A. There is some evidence that the efficiency of conversion diminishes with increasing levels of vitamin A in the diet. If that is so, any figure for equivalence of the vitamin and the provitamin can be only a rough approximation. Experts in this country and the United States seem, on this matter at any rate, to be largely in agreement that the only safe assumption for the